



Coarsening in Solid-Liquid Mixtures-2 ReFlight (CSLM-2 R)

Glenn Research Center



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Objective:

- Support the development and improve the accuracy of theoretical models of the Ostwald Ripening (coarsening) process.
- Determine the factors controlling the morphology of solid-liquid mixtures during coarsening.
- Determine the kinetics of the coarsening process, the spatial distribution of the particles, and the particle size distribution as function of the volume fraction of solid.

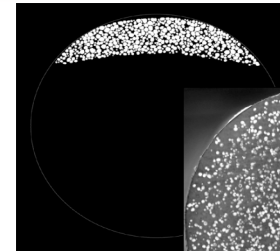
Relevance/Impact:

- CSLM-2 R results will provide input that will improve design codes that are based on incomplete models and databases.
- CSLM-2 R will thus aid in the development of new high-temperature materials, such as those used in nuclear propulsion and waste heat coolant loops.

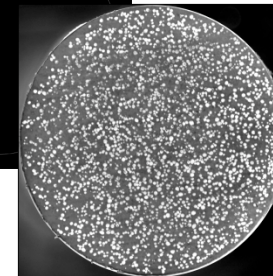
Development Approach:

- CSLM-2 ReFlight will use low volume fraction samples for the first time on ISS.
- Electrical Control Units (ECUs) were returned to GRC to replace the batteries. The CSLM-2 ReFlight support hardware is on-orbit the ISS.
- Samples are developed by the PI and then integrated into the Sample Processing Units (SPUs) by the engineering team.
- One ECU and 3 to 6 SPUs with low volume fraction samples are scheduled for launch on Flight 19A in March 2010.
- Six SPU's with low volume fraction samples will complete the CSLM-2 ReFlight test matrix.

Revision Date: 10/13/2009



Ground-Based Sample



CSLM-2 30% high volume sample from ISS Increment 16



Flight SPU#1 and Flight ECU#1 installed in the MSG on board ISS

ISS Resource Requirements

Accommodation (carrier)	Microgravity Science Glovebox
Upmass (kg) (w/o packing factor)	(6.5kg/SPU) 3 to 6 SPUs, 6.4 kg for 1 ECU
Volume (m ³) (w/o packing factor)	0.04 for 3 SPU's
Power (kw) (peak)	0.15 operate one SPU at time
Crew Time (hrs) (installation/operations)	14 hours crew time (2, 4, 10, 24, 34, 48 hrs autonomous ops)
Launch/Increment	19A/Increment 23

Project Life Cycle Schedule

Milestones	ICR	RDR	PDR	CDR	VRR	Safety	FHA	Launch	Ops	Return	Final Report
Actual	10/1998	N/A	N/A	9/2000	9/2000	1/2010	2/2010	3/2010	Inc 23	5/2010	Return+18m
Actual/Baseline											